

=> d 19

L9 ANSWER 1 OF 1 REGISTRY COPYRIGHT 2004 ACS on STN

RN 7664-93-9 REGISTRY

CN Sulfuric acid (8CI, 9CI) (CA INDEX NAME)

OTHER NAMES:

CN BOV

CN Brimstone acid

CN Contact acid

CN Dihydrogen sulfate

CN Dipping acid

CN NSC 248648

CN NSC 38965

CN Oil of vitriol

CN Sulphuric acid

CN Vitriol brown oil

FS 3D CONCORD

DR 127529-01-5, 119540-51-1, 140623-70-7

MF H2 O4 S

CI COM

LC STN Files: AGRICOLA, ANABSTR, AQUIRE, BIOBUSINESS, BIOSIS, BIOTECHNO,  
CA, CABA, CANCERLIT, CAOLD, CAPLUS, CASREACT, CBNB, CEN, CHEMCATS,  
CHEMINFORMRX, CHEMLIST, CHEMSAFE, CIN, CSCHEM, CSNB, DDFU, DETHERM\*,  
DIPPR\*, DRUGU, EMBASE, ENCOMPLIT, ENCOMPLIT2, ENCOMPPAT, ENCOMPPAT2,  
GMELIN\*, HSDB\*, IFICDB, IFIPAT, IFIUDB, IPA, MEDLINE, MRCK\*, MSDS-OHS,  
NIOSHTIC, PDLCOM\*, PIRA, PROMT, RTECS\*, SPECINFO, TOXCENTER, TULSA,  
ULIDAT, USAN, USPAT2, USPATFULL, VTB

(\*File contains numerically searchable property data)

Other Sources: DSL\*\*, EINECS\*\*, TSCA\*\*

(\*\*Enter CHEMLIST File for up-to-date regulatory information)

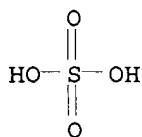
DT.CA Caplus document type: Book; Conference; Dissertation; Journal; Patent;  
Preprint; Report

RL.P Roles from patents: ANST (Analytical study); BIOL (Biological study);  
CMBI (Combinatorial study); FORM (Formation, nonpreparative); MSC  
(Miscellaneous); OCCU (Occurrence); PREP (Preparation); PROC (Process);  
PRP (Properties); RACT (Reactant or reagent); USES (Uses); NORL (No role  
in record)

RLD.P Roles for non-specific derivatives from patents: ANST (Analytical  
study); BIOL (Biological study); FORM (Formation, nonpreparative); MSC  
(Miscellaneous); OCCU (Occurrence); PREP (Preparation); PROC (Process);  
PRP (Properties); RACT (Reactant or reagent); USES (Uses)

RL.NP Roles from non-patents: ANST (Analytical study); BIOL (Biological  
study); FORM (Formation, nonpreparative); MSC (Miscellaneous); OCCU  
(Occurrence); PREP (Preparation); PROC (Process); PRP (Properties); RACT  
(Reactant or reagent); USES (Uses); NORL (No role in record)

RLD.NP Roles for non-specific derivatives from non-patents: ANST (Analytical  
study); BIOL (Biological study); FORM (Formation, nonpreparative); MSC  
(Miscellaneous); OCCU (Occurrence); PREP (Preparation); PROC (Process);  
PRP (Properties); RACT (Reactant or reagent); USES (Uses)



\*\*PROPERTY DATA AVAILABLE IN THE 'PROP' FORMAT\*\*

92354 REFERENCES IN FILE CA (1907 TO DATE)

4153 REFERENCES TO NON-SPECIFIC DERIVATIVES IN FILE CA

92455 REFERENCES IN FILE CAPLUS (1907 TO DATE)

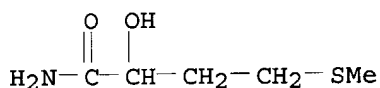
1 REFERENCES IN FILE CAOLD (PRIOR TO 1967)

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L12 1 49540-21-8  
(49540-21-8/RN)

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L12 ANSWER 1 OF 1 REGISTRY COPYRIGHT 2004 ACS on STN  
RN 49540-21-8 REGISTRY  
CN Butanamide, 2-hydroxy-4-(methylthio)- (9CI) (CA INDEX NAME)  
OTHER CA INDEX NAMES:  
CN Butyramide, 2-hydroxy-4-(methylthio)- (6CI)  
OTHER NAMES:  
CN 2-Hydroxy-4-(methylthio)butanamide  
CN 2-Hydroxy-4-(methylthio)butyramide  
FS 3D CONCORD  
MF C5 H11 N O2 S  
LC STN Files: BEILSTEIN\*, BIOSIS, CA, CAOLD, CAPLUS, CASREACT, IFICDB,  
IFIPAT, IFIUDB, USPAT2, USPATFULL  
(\*File contains numerically searchable property data)  
DT.CA Caplus document type: Journal; Patent  
RL.P Roles from patents: ANST (Analytical study); BIOL (Biological study);  
PREP (Preparation); PROC (Process); RACT (Reactant or reagent); USES  
(Uses); NORL (No role in record)  
RL.NP Roles from non-patents: BIOL (Biological study); PREP (Preparation);  
PROC (Process); NORL (No role in record)



\*\*PROPERTY DATA AVAILABLE IN THE 'PROP' FORMAT\*\*

41 REFERENCES IN FILE CA (1907 TO DATE)  
41 REFERENCES IN FILE CAPLUS (1907 TO DATE)  
2 REFERENCES IN FILE CAOLD (PRIOR TO 1967)

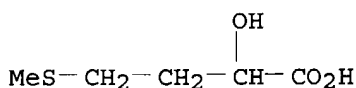
=> s 583-91-5

L13 1 583-91-5  
(583-91-5/RN)

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L13 ANSWER 1 OF 1 REGISTRY COPYRIGHT 2004 ACS on STN  
RN 583-91-5 REGISTRY  
CN Butanoic acid, 2-hydroxy-4-(methylthio)- (9CI) (CA INDEX NAME)  
OTHER CA INDEX NAMES:  
CN Butyric acid, 2-hydroxy-4-(methylthio)- (6CI, 8CI)  
OTHER NAMES:  
CN (+)-2-Hydroxy-4-(methylthio)butyric acid  
CN  $\alpha$ -Hydroxy- $\gamma$ -(methylmercapto)butyric acid  
CN  $\alpha$ -Hydroxy- $\gamma$ -(methylthio)butyric acid  
CN  $\alpha$ -Hydroxy-4-(methylthio)butyric acid  
CN  $\gamma$ -(Methylmercapto)- $\alpha$ -hydroxybutyric acid  
CN  $\gamma$ -(Methylthio)- $\alpha$ -hydroxybutyric acid  
CN 2-Hydroxy-4-(methylmercapto)butyric acid  
CN 2-Hydroxy-4-(methylthio)butanoic acid  
CN 2-Hydroxy-4-(methylthio)butyric acid  
CN Alimet  
CN Desmenidol  
CN DL- $\alpha$ -Hydroxy- $\gamma$ -methylmercaptobutyric acid  
CN DL-2-Hydroxy-4-(methylmercapto)butanoic acid  
CN DL-2-Hydroxy-4-(methylmercapto)butyric acid  
CN DL-2-Hydroxy-4-(methylthio)butanoic acid  
CN DL-2-Hydroxy-4-(methylthio)butyric acid  
CN Hydan L  
CN MHA acid

CN MHA-FA  
 FS 3D CONCORD  
 DR 120-91-2, 96661-25-5, 110518-19-9  
 MF C5 H10 O3 S  
 CI COM  
 LC STN Files: AGRICOLA, ANABSTR, BEILSTEIN\*, BIOBUSINESS, BIOSIS,  
 BIOTECHNO, CA, CAOLD, CAPLUS, CASREACT, CBNB, CEN, CHEMCATS,  
 CHEMINFORMRX, CHEMLIST, CIN, CSChem, DDFU, DRUGU, EMBASE, HSDB\*, IFICDB,  
 IFIPAT, IFIUDb, MEDLINE, MRCK\*, PROMT, RTECS\*, SPECINFO, TOXCENTER,  
 USAN, USPAT2, USPATFULL, VETU  
 (\*File contains numerically searchable property data)  
 Other Sources: DSL\*\*, EINECS\*\*, TSCA\*\*, WHO  
 (\*\*Enter CHEMLIST File for up-to-date regulatory information)  
 DT.CA Caplus document type: Conference; Dissertation; Journal; Patent  
 RL.P Roles from patents: BIOL (Biological study); FORM (Formation,  
 nonpreparative); PREP (Preparation); PROC (Process); PRP (Properties);  
 RACT (Reactant or reagent); USES (Uses); NORL (No role in record)  
 RLD.P Roles for non-specific derivatives from patents: BIOL (Biological  
 study); PREP (Preparation); PROC (Process); RACT (Reactant or reagent);  
 USES (Uses)  
 RL.NP Roles from non-patents: ANST (Analytical study); BIOL (Biological  
 study); FORM (Formation, nonpreparative); OCCU (Occurrence); PREP  
 (Preparation); PROC (Process); PRP (Properties); RACT (Reactant or  
 reagent); USES (Uses); NORL (No role in record)  
 RLD.NP Roles for non-specific derivatives from non-patents: ANST (Analytical  
 study); BIOL (Biological study)



\*\*PROPERTY DATA AVAILABLE IN THE 'PROP' FORMAT\*\*

411 REFERENCES IN FILE CA (1907 TO DATE)  
 18 REFERENCES TO NON-SPECIFIC DERIVATIVES IN FILE CA  
 412 REFERENCES IN FILE CAPLUS (1907 TO DATE)  
 18 REFERENCES IN FILE CAOLD (PRIOR TO 1967)

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(FILE 'HOME' ENTERED AT 13:49:50 ON 23 JUN 2004)

L1 FILE 'CAPLUS' ENTERED AT 13:51:12 ON 23 JUN 2004  
68 S 583-91-5/PREP  
S L1 AND 49540-21-8/REG#

L2 FILE 'REGISTRY' ENTERED AT 13:52:10 ON 23 JUN 2004  
1 S 49540-21-8/RN

L3 FILE 'CAPLUS' ENTERED AT 13:52:10 ON 23 JUN 2004  
41 S L2  
L4 22 S L1 AND L3  
S L4 AND 7664-93-9/REG#

L5 FILE 'REGISTRY' ENTERED AT 13:53:08 ON 23 JUN 2004  
1 S 7664-93-9/RN

L6 FILE 'CAPLUS' ENTERED AT 13:53:08 ON 23 JUN 2004  
92598 S L5  
L7 8 S L4 AND L6  
L8 8 S L7 AND HYDROLY?

L9 FILE 'REGISTRY' ENTERED AT 13:53:36 ON 23 JUN 2004  
1 S 7664-93-9  
L10 1 S 49540-21-8  
L11 1 S 583-91-5  
L12 1 S 49540-21-8  
L13 1 S 583-91-5

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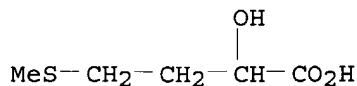
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L8 ANSWER 1 OF 8 CAPLUS COPYRIGHT 2004 ACS on STN  
ACCESSION NUMBER: 2002:767915 CAPLUS  
DOCUMENT NUMBER: 137:262770  
TITLE: Preparation of 2-hydroxy-4-methylthiobutanoic acid  
INVENTOR(S): Ikudome, Kenji; Shiozaki, Tetsuya  
PATENT ASSIGNEE(S): Sumitomo Chemical Co., Ltd., Japan  
SOURCE: Jpn. Kokai Tokkyo Koho, 6 pp.  
CODEN: JKXXAF  
DOCUMENT TYPE: Patent  
LANGUAGE: Japanese  
FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

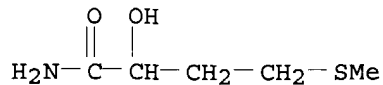
PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2002293770	A2	20021009	JP 2001-100630	20010330
PRIORITY APPLN. INFO.:			JP 2001-100630	20010330
OTHER SOURCE(S): CASREACT 137:262770				

AB The title compound is prepd by hydration of 2-hydroxy-4-methylthiobutanenitrile in the presence of H2SO4, and **hydrolysis** of 2-hydroxy-4-methylthiobutanamide in the presence of H2SO4, concentration of the reaction mixture, and separation of the product from the aqueous and the oil layers.

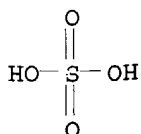
IT **583-91-5P**, 2-Hydroxy-4-methylthiobutanoic acid  
RL: IMF (Industrial manufacture); SPN (Synthetic preparation); **PREP (Preparation)**  
(preparation of 2-hydroxy-4-methylthiobutanoic acid from 2-hydroxy-4-methylthiobutanenitrile by hydration and **hydrolysis**)  
RN 583-91-5 CAPLUS  
CN Butanoic acid, 2-hydroxy-4-(methylthio)- (9CI) (CA INDEX NAME)



IT **49540-21-8P**, 2-Hydroxy-4-methylthiobutanamide  
RL: RCT (Reactant); SPN (Synthetic preparation); **PREP (Preparation)**; RACT (Reactant or reagent)  
(preparation of 2-hydroxy-4-methylthiobutanoic acid from 2-hydroxy-4-methylthiobutanenitrile by hydration and **hydrolysis**)  
RN 49540-21-8 CAPLUS  
CN Butanamide, 2-hydroxy-4-(methylthio)- (9CI) (CA INDEX NAME)



IT **7664-93-9**, Sulfuric acid, reactions  
RL: RGT (Reagent); RACT (Reactant or reagent)  
(preparation of 2-hydroxy-4-methylthiobutanoic acid from 2-hydroxy-4-methylthiobutanenitrile by hydration and **hydrolysis**)  
RN 7664-93-9 CAPLUS  
CN Sulfuric acid (8CI, 9CI) (CA INDEX NAME)



L8 ANSWER 2 OF 8 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 2002:688142 CAPLUS  
DOCUMENT NUMBER: 137:216681  
TITLE: Preparation of 2-hydroxy-4-methylthiobutanoic acid  
INVENTOR(S): Ikudome, Kenji; Shiozaki, Tetsuya  
PATENT ASSIGNEE(S): Sumitomo Chemical Co., Ltd., Japan  
SOURCE: Jpn. Kokai Tokkyo Koho, 5 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent  
LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2002255927	A2	20020911	JP 2001-51730	20010227
PRIORITY APPLN. INFO.:			JP 2001-51730	20010227

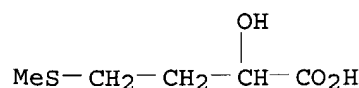
OTHER SOURCE(S): CASREACT 137:216681

AB Title compound (I) is prepared by (A) hydration of 2-hydroxy-4-methylthiobutanenitrile (II) in the presence of H<sub>2</sub>SO<sub>4</sub>, (B) **hydrolysis** of 2-hydroxy-4-methylthiobutanamide in the presence of H<sub>2</sub>SO<sub>4</sub>, and (C) separation of I-containing oil layers from aqueous layers, wherein total H<sub>2</sub>SO<sub>4</sub> used in the process A and B is 0.55-0.85 mol to 1 mol II, and total H<sub>2</sub>O used in A and B is 60-120 weight parts to 100 weight parts II. II (131.2 g) was treated with 58.8 g H<sub>2</sub>SO<sub>4</sub> in the presence of 42.6 g H<sub>2</sub>O at 50° for 3 h, mixed with 79.6 g H<sub>2</sub>O, heated at 115° for 6 h, and separated from the aqueous layer at 90° to give an oil layer with SO<sub>4</sub><sup>2-</sup> concentration 8.8 weight%.

IT **583-91-5P**, 2-Hydroxy-4-methylthiobutanoic acid  
RL: IMF (Industrial manufacture); PUR (Purification or recovery); SPN (Synthetic preparation); **PREP (Preparation)**  
(preparation of hydroxy(methylthio)butanoic acid)

RN 583-91-5 CAPLUS

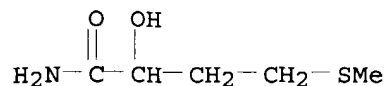
CN Butanoic acid, 2-hydroxy-4-(methylthio)- (9CI) (CA INDEX NAME)



IT **49540-21-8P**, 2-Hydroxy-4-methylthiobutanamide  
RL: IMF (Industrial manufacture); RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)  
(preparation of hydroxy(methylthio)butanoic acid)

RN 49540-21-8 CAPLUS

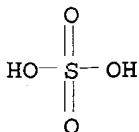
CN Butanamide, 2-hydroxy-4-(methylthio)- (9CI) (CA INDEX NAME)



IT **7664-93-9**, Sulfuric acid, reactions  
RL: RGT (Reagent); RACT (Reactant or reagent)  
(preparation of hydroxy(methylthio)butanoic acid)

RN 7664-93-9 CAPLUS

CN Sulfuric acid (8CI, 9CI) (CA INDEX NAME)



L8 ANSWER 3 OF 8 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 2002:90001 CAPLUS

DOCUMENT NUMBER: 136:134502

TITLE: Process for producing 2-hydroxy-4-methylthiobutanoic acid

INVENTOR(S): Ikudome, Kenji; Shiozaki, Tetsuya; Otani, Takehiro; Sudo, Shogo

PATENT ASSIGNEE(S): Sumitomo Chemical Company, Limited, Japan

SOURCE: PCT Int. Appl., 15 pp.

CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2002008181	A1	20020131	WO 2001-JP5982	20010709

W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, KE, KG, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM

RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG

JP 2002037769	A2	20020206	JP 2000-223436	20000725
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PRIORITY APPLN. INFO.: JP 2000-223436 A 20000725

OTHER SOURCE(S): CASREACT 136:134502

AB This document discloses a process for producing 2-hydroxy-4-methylthiobutanoic acid which comprises hydrating 2-hydroxy-4-methylthiobutanenitrile in the presence of sulfuric acid, **hydrolyzing** the 2-hydroxy-4-methylthiobutanamide contained in the reaction mixture, subsequently separating the resultant reaction mixture into an oil layer containing 2-hydroxy-4-methylthiobutanoic acid and an aqueous layer, and circulating a part of the aqueous layer to the **hydrolysis** step and/or the oil/water separation step. By the process, 2-hydroxy-4-methylthiobutanoic acid can be efficiently obtained in a satisfactory manner without using an organic solvent.

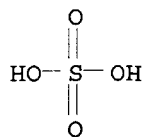
IT 7664-93-9, Sulfuric acid, uses

RL: CAT (Catalyst use); USES (Uses)

(process for producing 2-hydroxy-4-methylthiobutanoic acid)

RN 7664-93-9 CAPLUS

CN Sulfuric acid (8CI, 9CI) (CA INDEX NAME)



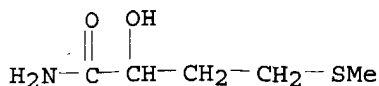
IT 49540-21-8P, 2-Hydroxy-4-methylthiobutanamide

RL: IMF (Industrial manufacture); RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)

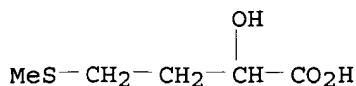
(process for producing 2-hydroxy-4-methylthiobutanoic acid)

RN 49540-21-8 CAPLUS

CN Butanamide, 2-hydroxy-4-(methylthio)- (9CI) (CA INDEX NAME)



IT 583-91-5P, 2-Hydroxy-4-methylthiobutanoic acid  
 RL: IMF (Industrial manufacture); SPN (Synthetic preparation); **PREP**  
 (Preparation)  
 (process for producing 2-hydroxy-4-methylthiobutanoic acid)  
 RN 583-91-5 CAPLUS  
 CN Butanoic acid, 2-hydroxy-4-(methylthio)- (9CI) (CA INDEX NAME)



REFERENCE COUNT: 21 THERE ARE 21 CITED REFERENCES AVAILABLE FOR THIS  
 RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L8 ANSWER 4 OF 8 CAPLUS COPYRIGHT 2004 ACS on STN  
 ACCESSION NUMBER: 2000:725606 CAPLUS  
 DOCUMENT NUMBER: 133:266515  
 TITLE: Process for the preparation of alkyl  
 2-hydroxy-4-(methylthio)butyric acid esters by the  
 sulfuric acid **hydrolysis** and esterification  
 of 2-hydroxy-4-(methylthio)butyronitrile with alkanols  
 Garrait, Michel; Casse, Claude; Gros, Georges  
 INVENTOR(S):  
 PATENT ASSIGNEE(S): Aventis Animal Nutrition S.A., Fr.  
 SOURCE: PCT Int. Appl., 16 pp.  
 CODEN: PIXXD2  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

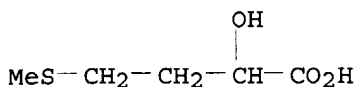
PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2000059877	A1	20001012	WO 2000-EP3101	20000330
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			CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU,	
			ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU,	
			LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE,	
			SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA,	
			ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM	
RW:			GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE,	
			DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF,	
			CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG	
FR 2791673	A1	20001006	FR 1999-4142	19990402
FR 2791673	B1	20010608		
NZ 514106	A	20010928	NZ 2000-514106	20000330
EP 1165503	A1	20020102	EP 2000-918858	20000330
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			IE, SI, LT, LV, FI, RO	
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JP 2002541140	T2	20021203	JP 2000-609390	20000330
TW 503233	B	20020921	TW 2000-89106145	20000511
NO 2001004787	A	20011129	NO 2001-4787	20011001
US 6479695	B1	20021112	US 2001-937702	20011228
PRIORITY APPLN. INFO.:			FR 1999-4142	A 19990402
			WO 2000-EP3101	W 20000330

OTHER SOURCE(S): CASREACT 133:266515  
 AB The preparation of 2-hydroxy-4-(methylthio)butyric acid esters [e.g., iso-Pr  
 2-hydroxy-4-(methylthio)butyrate] comprises: (a) a first step of reacting  
 2-hydroxy-4-(methylthio)butyronitrile with sulfuric acid to produce  
 2-hydroxy-4-(methylthio)butyramide; and (b) a second step of reacting the  
 2-hydroxy-4-methylthiobutyramide with an alc. (e.g., isopropanol) to

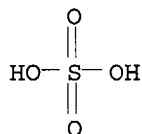


produce a 2-hydroxy-4-methylthiobutyric acid ester, the two steps being carried out in the same reaction medium.

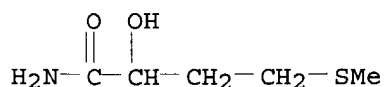
IT **583-91-5DP**, 2-Hydroxy-4-(methylthio)butyric acid, glycerol esters  
RL: FFD (Food or feed use); SPN (Synthetic preparation); BIOL (Biological study); **PREP (Preparation)**; USES (Uses)  
(process for the preparation of alkyl 2-hydroxy-4-(methylthio)butyric acid esters by the sulfuric acid **hydrolysis** and esterification of 2-hydroxy-4-(methylthio)butyronitrile with alkanols)  
RN 583-91-5 CAPLUS  
CN Butanoic acid, 2-hydroxy-4-(methylthio)- (9CI) (CA INDEX NAME)



IT **7664-93-9**, Sulfuric acid, uses  
RL: NUU (Other use, unclassified); USES (Uses)  
(process for the preparation of alkyl 2-hydroxy-4-(methylthio)butyric acid esters by the sulfuric acid **hydrolysis** and esterification of 2-hydroxy-4-(methylthio)butyronitrile with alkanols)  
RN 7664-93-9 CAPLUS  
CN Sulfuric acid (8CI, 9CI) (CA INDEX NAME)



IT **49540-21-8P**, 2-Hydroxy-4-(methylthio)butyramide  
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)  
(process for the preparation of alkyl 2-hydroxy-4-(methylthio)butyric acid esters by the sulfuric acid **hydrolysis** and esterification of 2-hydroxy-4-(methylthio)butyronitrile with alkanols)  
RN 49540-21-8 CAPLUS  
CN Butanamide, 2-hydroxy-4-(methylthio)- (9CI) (CA INDEX NAME)



REFERENCE COUNT: 6 THERE ARE 6 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L8 ANSWER 5 OF 8 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 2000:53574 CAPLUS

DOCUMENT NUMBER: 132:78291

TITLE: Two-step **hydrolytic** method for preparing 2-hydroxy-4-(methylthio)butyric acid from 2-hydroxy-4-(methylthio)butyronitrile using sulfuric acid and water

INVENTOR(S): Garrait, Michel; Gros, Georges

PATENT ASSIGNEE(S): Rhone-Poulenc Animal Nutrition S.A., Fr.

SOURCE: PCT Int. Appl., 24 pp.  
CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: French

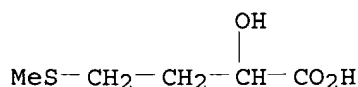
FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

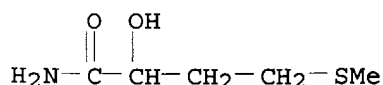
PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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WO 2000002852 A1 20000120 WO 1999-FR1637 19990707  
W: AE, AL, AU, BA, BB, BG, BR, CA, CN, CU, CZ, EE, GD, GE, HR, HU, ID, IL, IN, IS, JP, KP, KR, LC, LK, LR, LT, LV, MG, MK, MN, MX, NO, NZ, PL, RO, RU, SG, SI, SK, SL, TR, TT, UA, US, UZ, VN, YU, ZA, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM  
RW: GH, GM, KE, LS, MW, SD, SL, SZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG  
FR 2780968 A1 20000114 FR 1998-8872 19980710  
FR 2780968 B1 20000818  
CA 2337275 AA 20000120 CA 1999-2337275 19990707  
AU 9946245 A1 20000201 AU 1999-46245 19990707  
AU 760294 B2 20030508  
BR 9912016 A 20010410 BR 1999-12016 19990707  
EP 1097130 A1 20010509 EP 1999-929422 19990707  
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO  
TR 200100016 T2 20010521 TR 2001-20010001619990707  
JP 2002520310 T2 20020709 JP 2000-559083 19990707  
NZ 508908 A 20030725 NZ 1999-508908 19990707  
PRIORITY APPLN. INFO.: FR 1998-8872 A 19980710  
WO 1999-FR1637 W 19990707

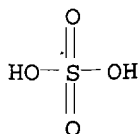
OTHER SOURCE(S): CASREACT 132:78291  
AB 2-Hydroxy-4-(methylthio)butyric acid, useful as an animal feed supplement (no data), is prepared in high yield and selectivity by the two-step sulfuric acid **hydrolysis** of 2-hydroxy-4-(methylthio)butyronitrile (I) using a 0.6-0.88 M quantity of the sulfuric acid relative to I and in the presence of 1-3 mol of water per mol of I at  $\leq 60^\circ$  to form 2-hydroxy-4-(methylthio)butyramide which is then subjected to a second **hydrolysis** with sulfuric acid in the presence of a supplementary quantity of water.  
IT 583-91-5P, 2-Hydroxy-4-(methylthio)butyric acid  
RL: FFD (Food or feed use); IMF (Industrial manufacture); BIOL (Biological study); **PREP (Preparation)**; USES (Uses)  
(two-step **hydrolytic** method for preparing 2-hydroxy-4-(methylthio)butyric acid from 2-hydroxy-4-(methylthio)butyronitrile using sulfuric acid and water)  
RN 583-91-5 CAPLUS  
CN Butanoic acid, 2-hydroxy-4-(methylthio)- (9CI) (CA INDEX NAME)



IT 49540-21-8P, 2-Hydroxy-4-(methylthio)butyramide  
RL: IMF (Industrial manufacture); RCT (Reactant); **PREP (Preparation)**; RACT (Reactant or reagent)  
(two-step **hydrolytic** method for preparing 2-hydroxy-4-(methylthio)butyric acid from 2-hydroxy-4-(methylthio)butyronitrile using sulfuric acid and water)  
RN 49540-21-8 CAPLUS  
CN Butanamide, 2-hydroxy-4-(methylthio)- (9CI) (CA INDEX NAME)



IT 7664-93-9, Sulfuric acid, reactions  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(two-step **hydrolytic** method for preparing 2-hydroxy-4-(methylthio)butyric acid from 2-hydroxy-4-(methylthio)butyronitrile using sulfuric acid and water)  
RN 7664-93-9 CAPLUS  
CN Sulfuric acid (8CI, 9CI) (CA INDEX NAME)



REFERENCE COUNT: 3 THERE ARE 3 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L8 ANSWER 6 OF 8 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1999:34521 CAPLUS

DOCUMENT NUMBER: 130:83195

TITLE: Continuous **hydrolysis** process for preparing 2-hydroxy-4-(methylthio)butanoic acid or its salts from 2-hydroxy-4-(methylthio)butyronitrile by way of the amide intermediate

INVENTOR(S): Hsu, Yung C.; Blackburn, Thomas F.; Pellegrin, Paul F.; Kranz, Allen H.; Willock, James M.

PATENT ASSIGNEE(S): Novus International, Inc., USA

SOURCE: U.S., 34 pp., Cont.-in-part of U.S. Ser. No. 477,768, abandoned.

CODEN: USXXAM

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 2

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 5856567	A	19990105	US 1996-647161	19960521
TW 495500	B	20020721	TW 1996-85106567	19960601
WO 9640630	A1	19961219	WO 1996-US8527	19960604
W: AL, AM, AT, AU, AZ, BB, BG, BR, BY, CA, CH, CN, CZ, DE, DK, EE, ES, FI, GB, GE, HU, IS, JP, KE, KG, KP, KR, KZ, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI				
RW: KE, LS, MW, SD, SZ, UG, AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, ML				
AU 9659741	A1	19961230	AU 1996-59741	19960604
AU 724680	B2	20000928		
EP 832062	A1	19980401	EP 1996-917048	19960604
EP 832062	B1	20010912		
R: BE, DE, DK, ES, FR, GB, IT, LU, NL, MC, PT, IE				
CN 1189819	A	19980805	CN 1996-195193	19960604
CN 1094925	B	20021127		
BR 9609182	A	19990511	BR 1996-9182	19960604
JP 11508876	T2	19990803	JP 1996-501098	19960604
EP 1120406	A2	20010801	EP 2001-110665	19960604
R: BE, DE, DK, ES, FR, GB, IT, LU, NL, MC, PT, IE				
ES 2164244	T3	20020216	ES 1996-917048	19960604
RU 2179550	C2	20020220	RU 1998-100197	19960604
PT 832062	T	20020328	PT 1996-917048	19960604
ZA 9604884	A	19970107	ZA 1996-4884	19960607
US 5998664	A	19991207	US 1997-876011	19970613
US 6166250	A	20001226	US 1998-165806	19981002
US 6268531	B1	20010731	US 1998-165819	19981002
US 2001007041	A1	20010705	US 2000-748067	20001222
US 6458997	B2	20021001		
US 2001001105	A1	20010510	US 2000-750584	20001228
US 6531101	B2	20030311		
US 2003144547	A1	20030731	US 2002-211808	20020802

PRIORITY APPLN. INFO.:

US 1995-477768	B2	19950607
US 1996-647161	A	19960521
EP 1996-917048	A3	19960604
WO 1996-US8527	W	19960604
US 1997-876011	A3	19970613
US 1998-165806	A3	19981002

OTHER SOURCE(S): CASREACT 130:83195

AB A continuous process for the preparation of 2-hydroxy-4-methylthiobutanoic acid (I), or its salts, comprises introducing an aqueous mineral acid (e.g., aqueous sulfuric acid) into a nitrile **hydrolysis** reactor (i.e., a continuous stirred tank reactor) and introducing 2-hydroxy-4-methylthiobutanenitrile into the reactor to produce a continuous **hydrolysis** product stream containing 2-hydroxy-4-methylthiobutanamide. The reactor **hydrolysis** product stream is continuously introduced into an amide **hydrolysis** flow reactor and continually **hydrolyzed** to an aqueous I-containing **hydrolyzate**.

IT 583-91-5DP, 2-Hydroxy-4-(methylthio)butanoic acid, salts

583-91-5P, 2-Hydroxy-4-(methylthio)butanoic acid

RL: IMF (Industrial manufacture); PREP (Preparation)

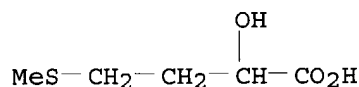
(continuous **hydrolysis** process for preparing

2-hydroxy-4-(methylthio)butanoic acid or its salts from

2-hydroxy-4-(methylthio)butyronitrile by way of the amide intermediate)

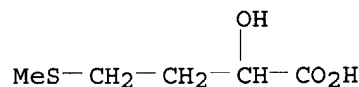
RN 583-91-5 CAPLUS

CN Butanoic acid, 2-hydroxy-4-(methylthio)- (9CI) (CA INDEX NAME)



RN 583-91-5 CAPLUS

CN Butanoic acid, 2-hydroxy-4-(methylthio)- (9CI) (CA INDEX NAME)



IT 49540-21-8P, 2-Hydroxy-4-(methylthio)butanamide

RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)

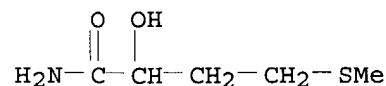
(continuous **hydrolysis** process for preparing

2-hydroxy-4-(methylthio)butanoic acid or its salts from

2-hydroxy-4-(methylthio)butyronitrile by way of the amide intermediate)

RN 49540-21-8 CAPLUS

CN Butanamide, 2-hydroxy-4-(methylthio)- (9CI) (CA INDEX NAME)



IT 7664-93-9, Sulfuric acid, reactions

RL: RCT (Reactant); RACT (Reactant or reagent)

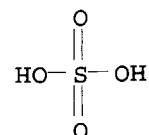
(continuous **hydrolysis** process for preparing

2-hydroxy-4-(methylthio)butanoic acid or its salts from

2-hydroxy-4-(methylthio)butyronitrile by way of the amide intermediate)

RN 7664-93-9 CAPLUS

CN Sulfuric acid (8CI, 9CI) (CA INDEX NAME)



ACCESSION NUMBER: 1997:121421 CAPLUS

DOCUMENT NUMBER: 126:131191

TITLE: Continuous **hydrolysis** process for preparation of 2-hydroxy-4-methylthiobutanoic acid or its salts

INVENTOR(S): Hsu, Yung C.; Blackburn, Thomas F.; Pellegrin, Paul F.; Kranz, Allen H.; Willock, James M.

PATENT ASSIGNEE(S): Novus International, Inc., USA

SOURCE: PCT Int. Appl., 125 pp.

CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 2

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 9640630	A1	19961219	WO 1996-US8527	19960604
W: AL, AM, AT, AU, AZ, BB, BG, BR, BY, CA, CH, CN, CZ, DE, DK, EE, ES, FI, GB, GE, HU, IS, JP, KE, KG, KP, KR, KZ, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI				
RW: KE, LS, MW, SD, SZ, UG, AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, ML				
US 5856567	A	19990105	US 1996-647161	19960521
AU 9659741	A1	19961230	AU 1996-59741	19960604
AU 724680	B2	20000928		
EP 832062	A1	19980401	EP 1996-917048	19960604
EP 832062	B1	20010912		
R: BE, DE, DK, ES, FR, GB, IT, LU, NL, MC, PT, IE				
BR 9609182	A	19990511	BR 1996-9182	19960604
JP 11508876	T2	19990803	JP 1996-501098	19960604
RU 2179550	C2	20020220	RU 1998-100197	19960604
US 6166250	A	20001226	US 1998-165806	19981002
US 2001007041	A1	20010705	US 2000-748067	20001222
US 6458997	B2	20021001		
US 2003144547	A1	20030731	US 2002-211808	20020802

PRIORITY APPLN. INFO.:

US 1995-477768	A	19950607
US 1996-647161	A	19960521
WO 1996-US8527	W	19960604
US 1997-876011	A3	19970613
US 1998-165806	A3	19981002
US 2000-748067	A3	20001222

AB The process includes introducing an aqueous mineral acid (especially concentrated H<sub>2</sub>SO<sub>4</sub>) into a nitrile **hydrolysis** reactor including a continuously stirred tank reactor and introducing 2-hydroxy-4-methylthiobutanenitrile into the nitrile **hydrolysis** reactor. 2-Hydroxy-4-methylthiobutanenitrile is continually **hydrolyzed** to produce a product stream containing 2-hydroxy-4-methylthiobutanamide which is subsequently **hydrolyzed** within the amide **hydrolysis** flow reactor to produce 2-hydroxy-4-methylthiobutanoic acid which is then recovered from the aqueous **hydrolyzate** product.

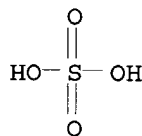
IT 7664-93-9, Sulfuric acid, reactions

RL: RCT (Reactant); RACT (Reactant or reagent)

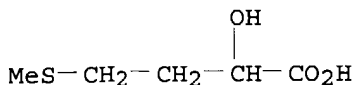
(concentrated; continuous **hydrolysis** process for preparation of 2-hydroxy-4-methylthiobutanoic acid or its salts)

RN 7664-93-9 CAPLUS

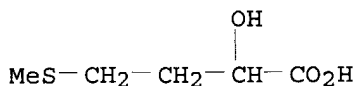
CN Sulfuric acid (8CI, 9CI) (CA INDEX NAME)



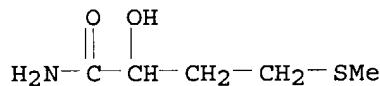
IT \* 583-91-5DP, 2-Hydroxy-4-methylthiobutanoic acid, salts  
 583-91-5P, 2-Hydroxy-4-methylthiobutanoic acid  
 RL: IMF (Industrial manufacture); SPN (Synthetic preparation); PREP  
 (Preparation)  
 (continuous hydrolysis process for preparation of  
 2-hydroxy-4-methylthiobutanoic acid or its salts)  
 RN 583-91-5 CAPLUS  
 CN Butanoic acid, 2-hydroxy-4-(methylthio)- (9CI) (CA INDEX NAME)



RN 583-91-5 CAPLUS  
 CN Butanoic acid, 2-hydroxy-4-(methylthio)- (9CI) (CA INDEX NAME)



IT 49540-21-8P, 2-Hydroxy-4-methylthiobutanamide  
 RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT  
 (Reactant or reagent)  
 (continuous hydrolysis process for preparation of  
 2-hydroxy-4-methylthiobutanoic acid or its salts)  
 RN 49540-21-8 CAPLUS  
 CN Butanamide, 2-hydroxy-4-(methylthio)- (9CI) (CA INDEX NAME)



L8 ANSWER 8 OF 8 CAPLUS COPYRIGHT 2004 ACS on STN  
 ACCESSION NUMBER: 1986:5569 CAPLUS  
 DOCUMENT NUMBER: 104:5569  
 TITLE: Liquid 2-hydroxymethylthiobutyric acid  
 INVENTOR(S): Ruest, Dennis Arthur; Takano, Masaharu; Wolf, Lawrence  
 Russell  
 PATENT ASSIGNEE(S): Monsanto Co. , USA  
 SOURCE: Eur. Pat. Appl., 51 pp.  
 CODEN: EPXXDW  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 142488	A2	19850522	EP 1984-870150	19841113
EP 142488	A3	19850626		
EP 142488	B1	19870826		
R: AT, BE, CH, DE, FR, IT, LI, LU, NL, SE				
US 4524077	A	19850618	US 1983-550857	19831114
AU 8435359	A1	19850523	AU 1984-35359	19841113
AU 562078	B2	19870528		
GB 2149791	A1	19850619	GB 1984-28657	19841113
GB 2149791	B2	19880420		
JP 60156396	A2	19850816	JP 1984-239325	19841113
JP 05001787	B4	19930111		
ZA 8408847	A	19850925	ZA 1984-8847	19841113
AT 29131	E	19870915	AT 1984-870150	19841113
SU 1428193	A3	19880930	SU 1984-3812267	19841113

CA 1263668	A1	19891205	CA 1984-467699	19841113
JP 05211846	A2	19930824	JP 1992-199865	19920727
JP 07097970	B4	19951025		

PRIORITY APPLN. INFO.:	US 1983-550857	19831114
	EP 1984-870150	19841113

OTHER SOURCE(S): CASREACT 104:5569

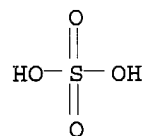
AB MeSCH<sub>2</sub>CH<sub>2</sub>CH(OH)CN (I) is **hydrolyzed** with 50-70 weight % H<sub>2</sub>SO<sub>4</sub> to give MeSCH<sub>2</sub>CH<sub>2</sub>CH(OH)CONH<sub>2</sub>, which is further **hydrolyzed** with 30-50% H<sub>2</sub>SO<sub>4</sub> to give MeSCH<sub>2</sub>CH<sub>2</sub>CH(OH)CO<sub>2</sub>H (II). II is recovered by liquid-liquid extraction. Thus, I was treated with 50% H<sub>2</sub>SO<sub>4</sub> at 50° for 1 h, followed by heating at 90° for 100 min, neutralization with NH<sub>3</sub>, and extraction of II with MeCOPr. II had lighter color, less odor, lower viscosity and better thermal stability, compared to II prepared by standard methods. II is a feed supplement.

IT 7664-93-9, reactions

RL: RCT (Reactant); RACT (Reactant or reagent)  
(**hydrolysis** by, of hydroxy(methylthio)butyronitrile, in manufacture of hydroxymethylthiobutyric acid)

RN 7664-93-9 CAPLUS

CN Sulfuric acid (8CI, 9CI) (CA INDEX NAME)

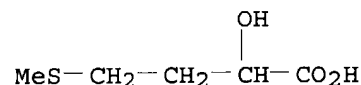


IT 583-91-5P

RL: PREP (Preparation)  
(manufacture of, **hydrolysis** and extraction process for)

RN 583-91-5 CAPLUS

CN Butanoic acid, 2-hydroxy-4-(methylthio)- (9CI) (CA INDEX NAME)



IT 49540-21-8P

RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)  
(preparation and **hydrolysis** of, process for)

RN 49540-21-8 CAPLUS

CN Butanamide, 2-hydroxy-4-(methylthio)- (9CI) (CA INDEX NAME)

